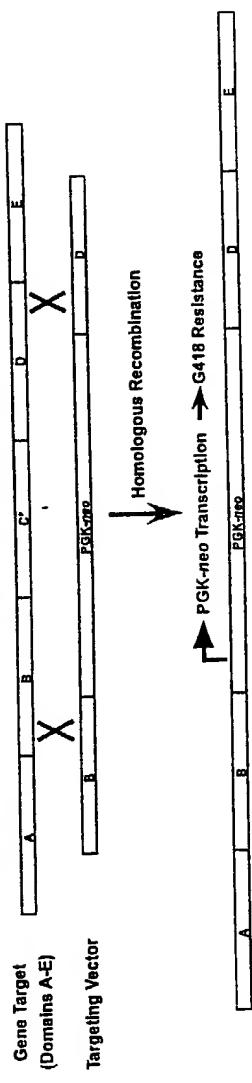
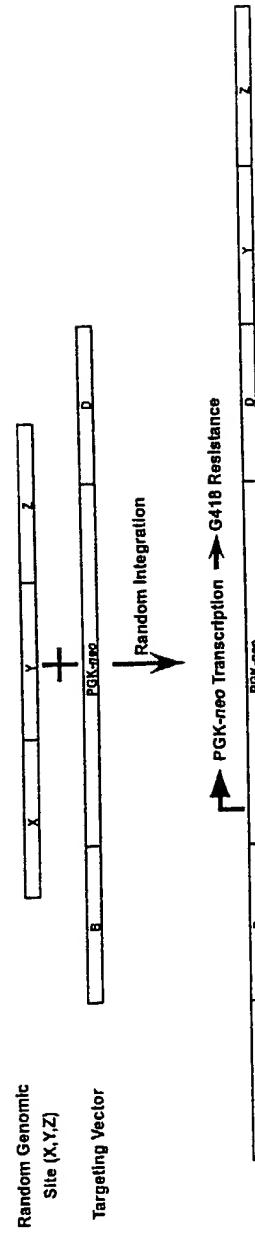


FIGURE 1

A. Homologous Recombination: G418 Resistance. Targeting Vector Flanked by "A" and "E"

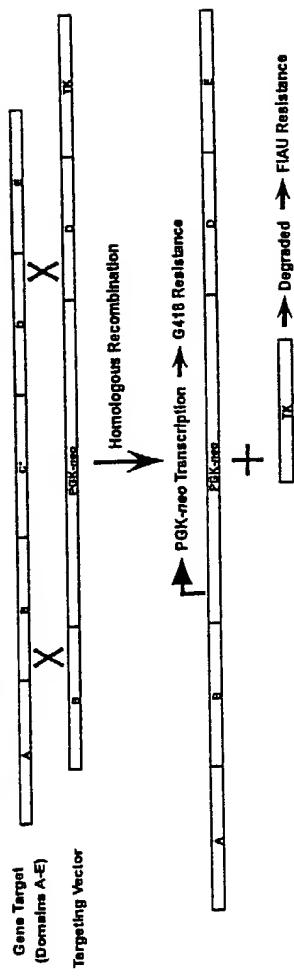
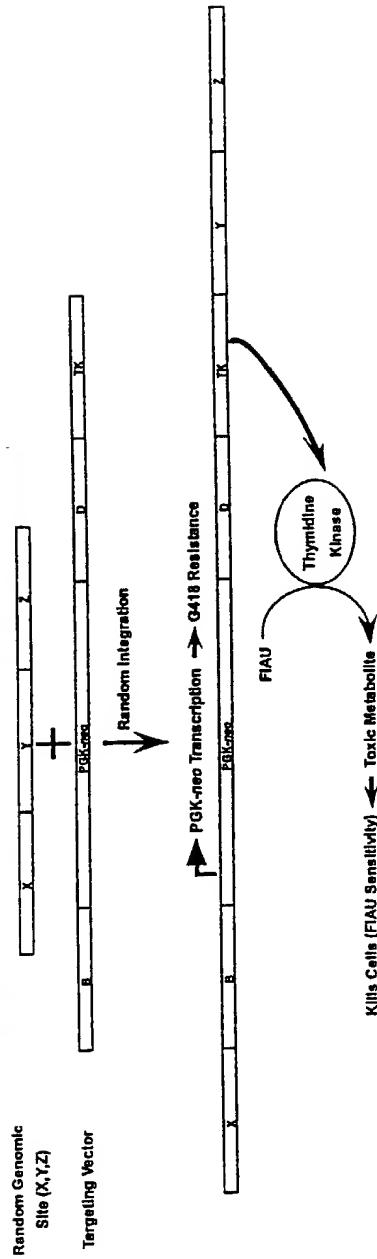
**B.**

Random Integration: G418 Resistance. Targeting Vector Flanked by "X" and "Y"



DISTINGUISH EVENTS BY SCREENING MOLECULARLY (PCR & SOUTHERN)

FIGURE 2

A.**Homologous Recombination: G418 Resistance + FIAU Resistance****B.****Random Integration: G418 Resistance + FIAU Sensitivity****FIGURE 3**

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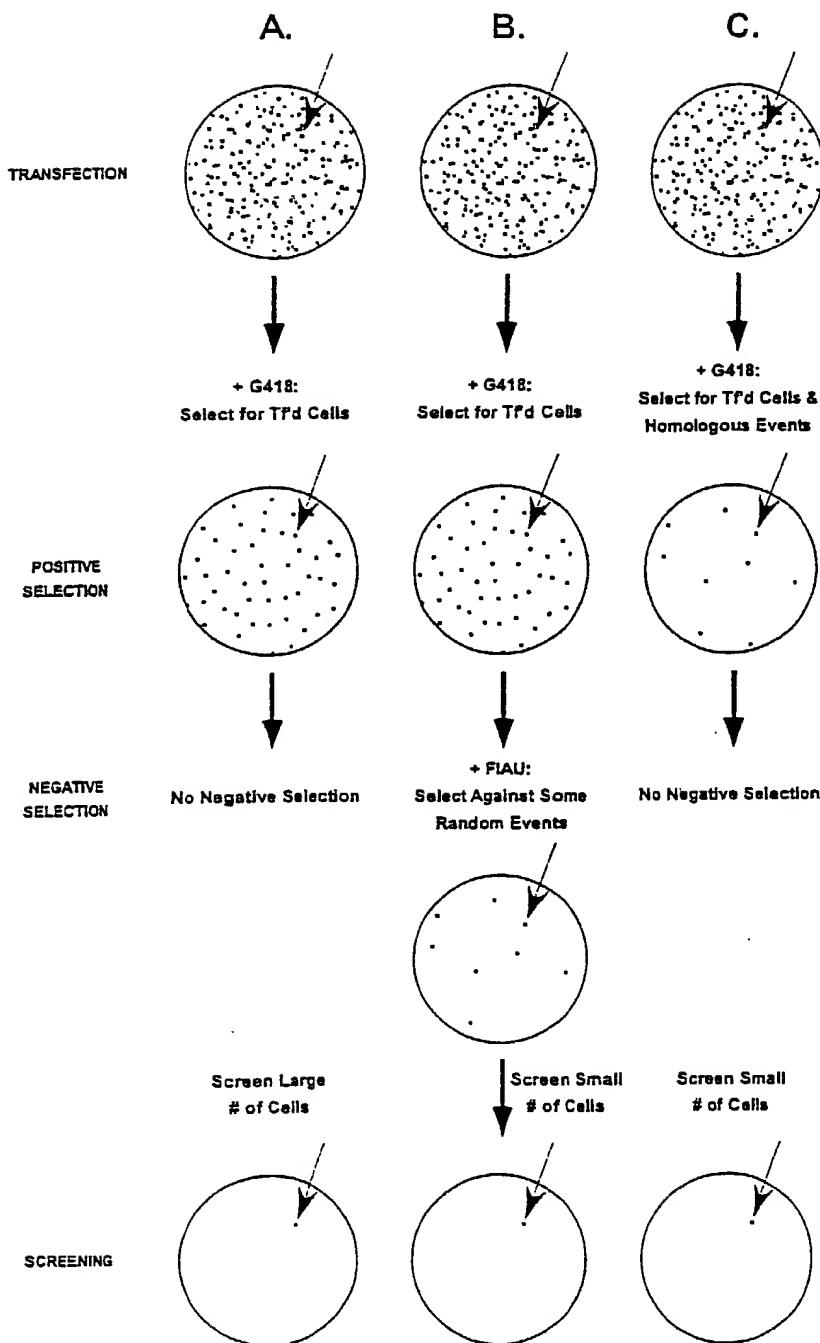


FIGURE 4

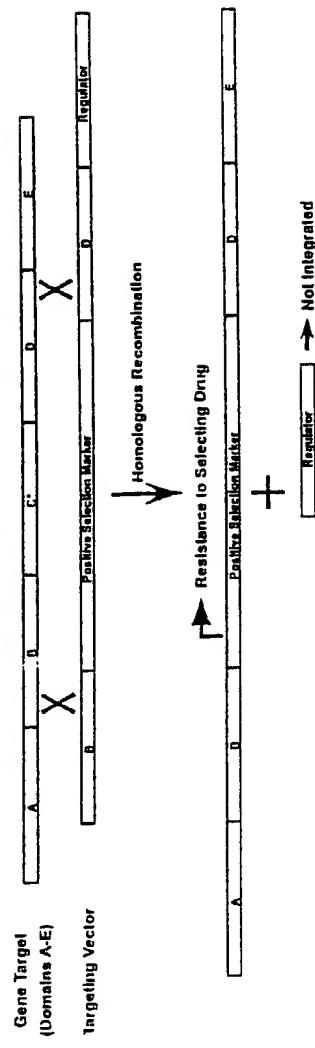
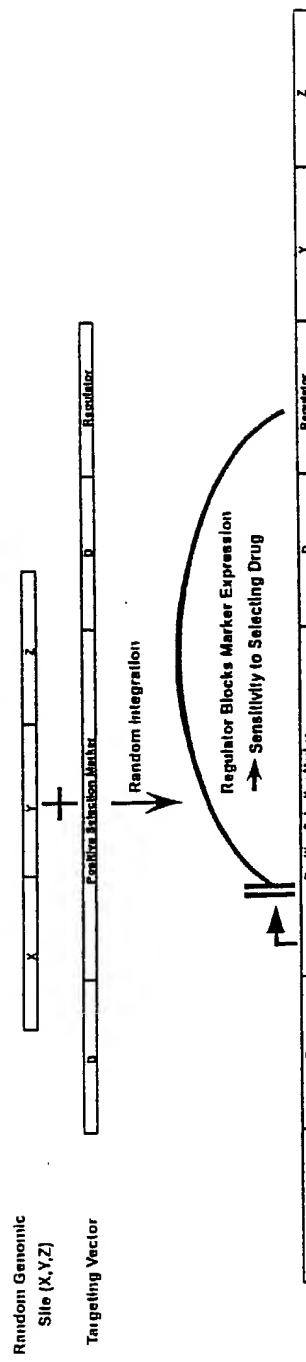
A.**Homologous Recombination: Resistance to Selecting Drug****B.****Random Integration: Sensitivity to Selecting Drug****FIGURE 5**

FIGURE 6A

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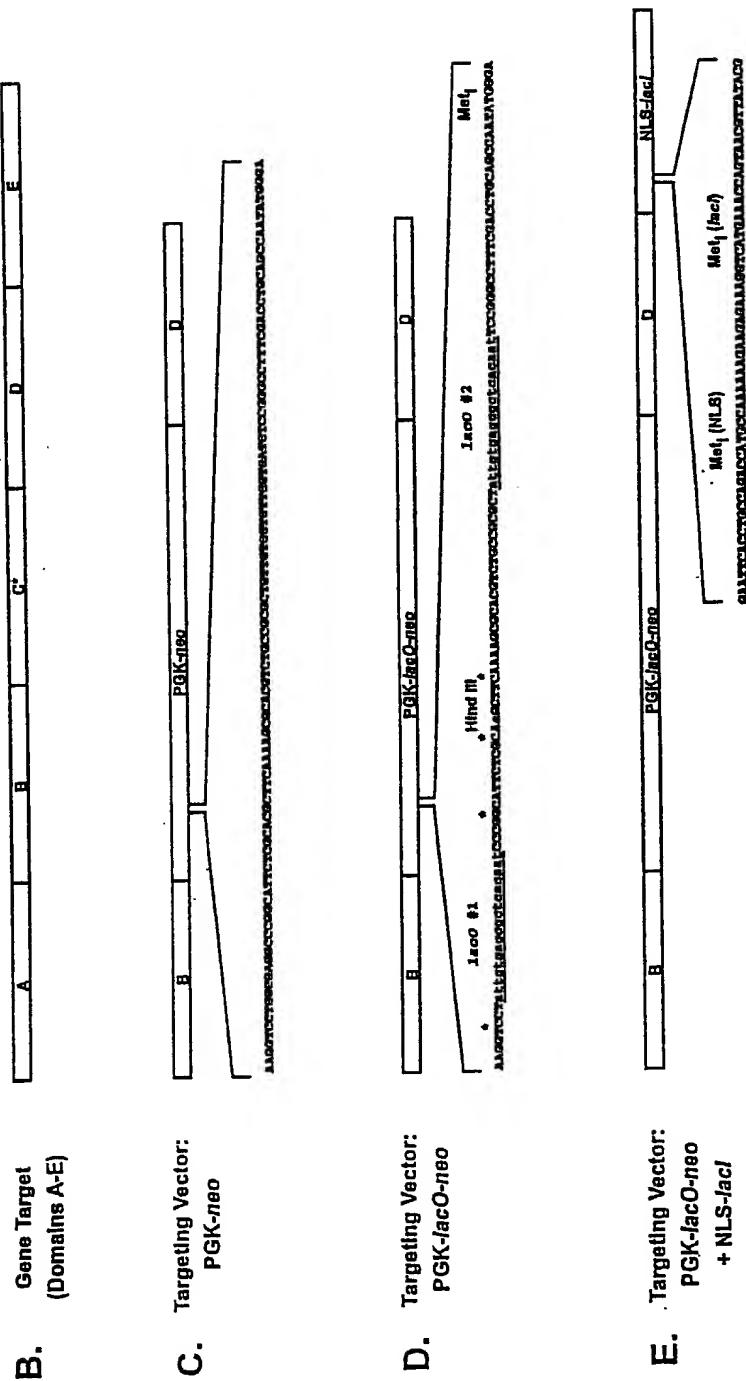


FIGURE 6 B-E

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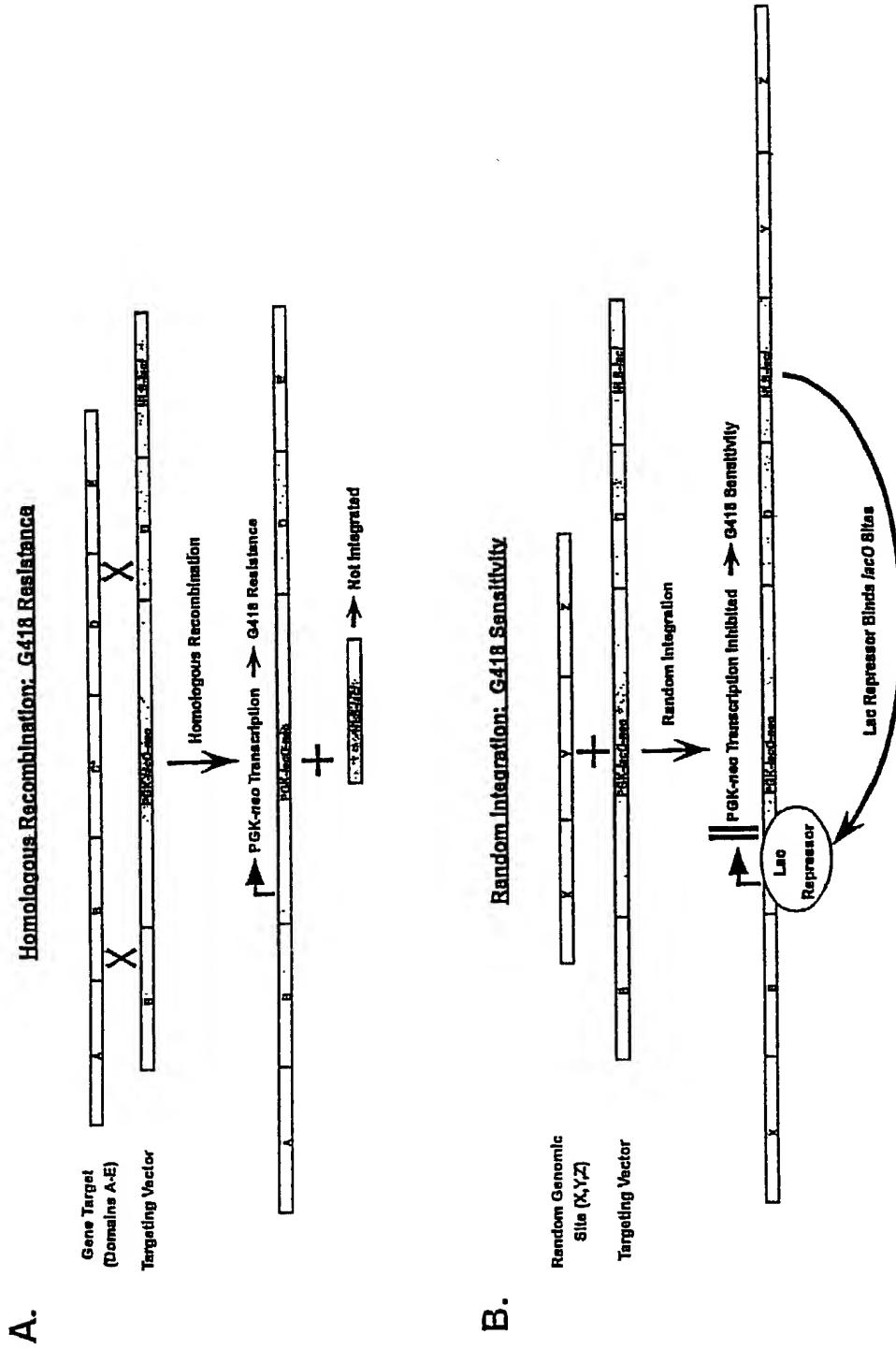


FIGURE 7

<u>Oligo #</u>	<u>Sequence (5' to 3')</u>
10164	CGGAATTCACCTGCCAGACCATGCCAAAAAGAARGAGAAAGGTATGAAACCAGTAACGTTATACG
10165	CGGAATTCTCACTGCCCGCTTCCAGTCG
10218	GCATTCTCGCAAGCTTCAAAAGCGCACGTCTGCCGCCTATTGTGAGCGCTCACATTCCGGGCCTTCGACCTG
9959	TCATCAATTCTGCAGAC
10219	TGCGCTTTGAAGCTTGCGAGAATGCCGGATTGTGAGCGCTCACATAAGGACCTCGCGCCCCGCC
4201	CAGGAAACAGCTATGAC

FIGURE 8

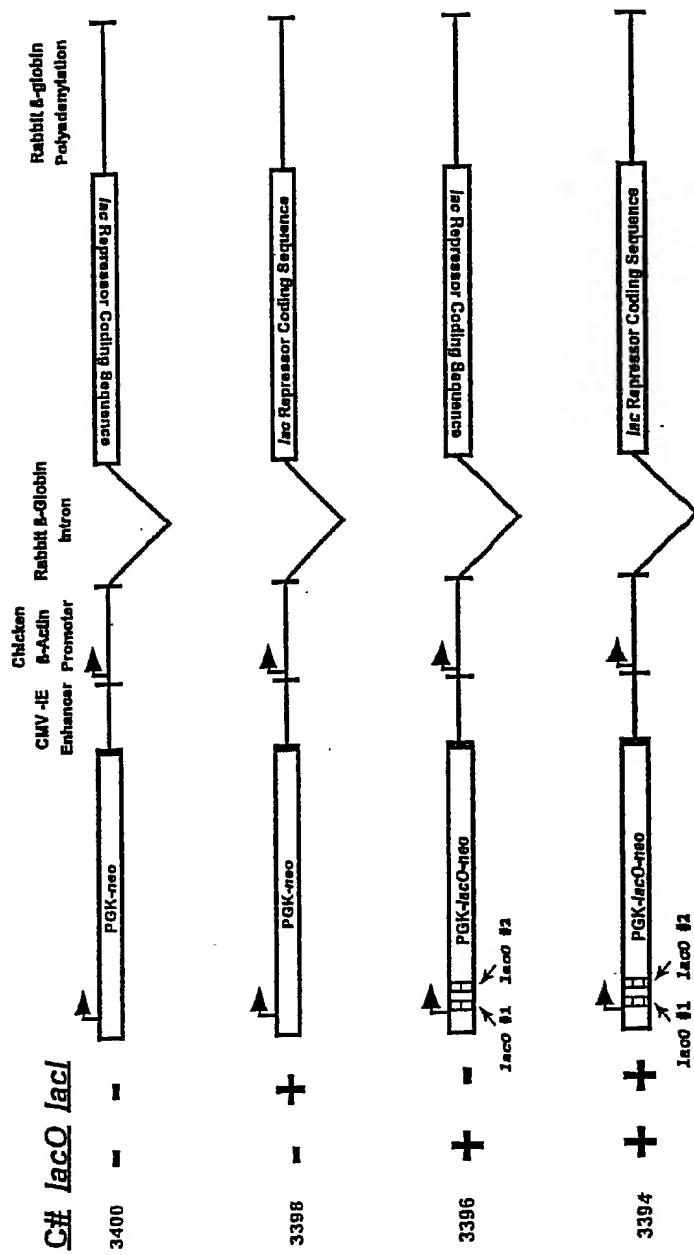


FIGURE 9

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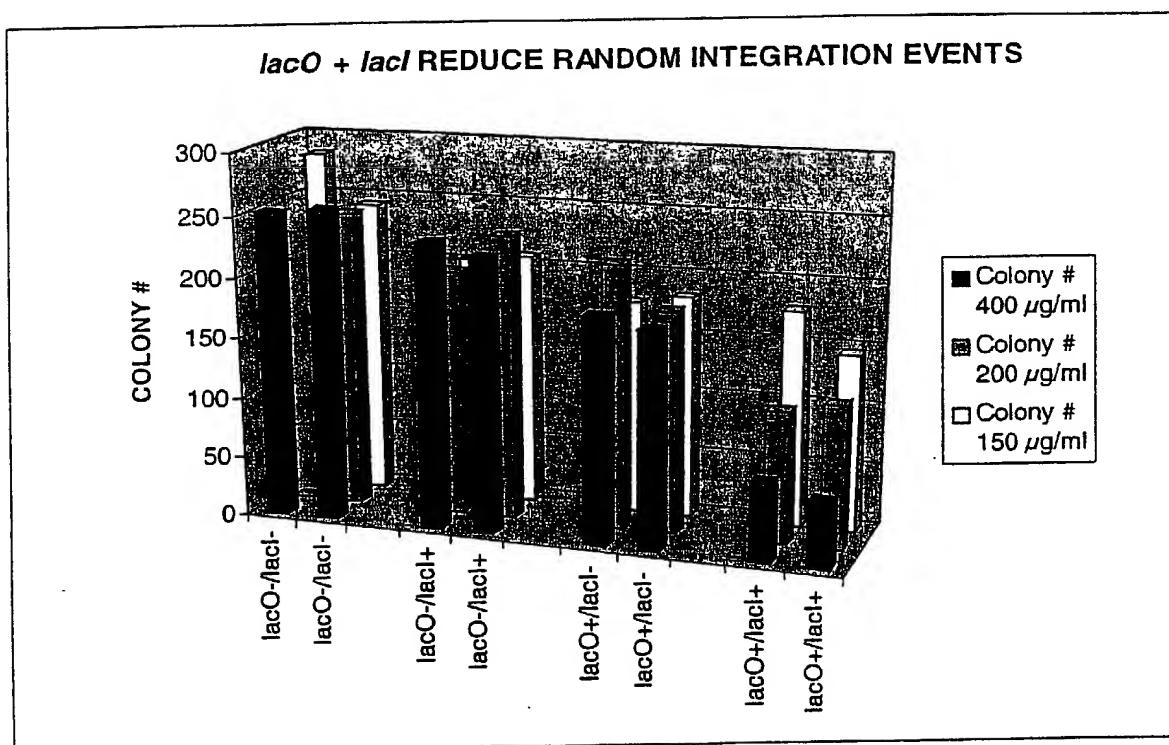


FIGURE 10

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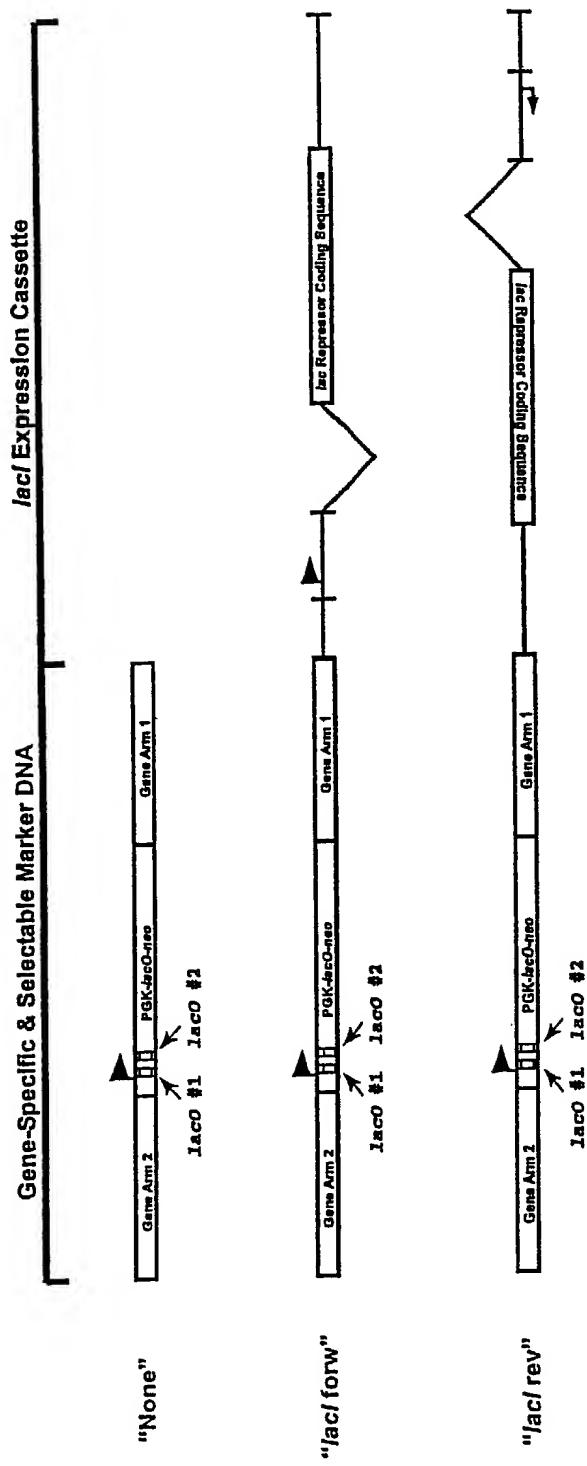


FIGURE 11

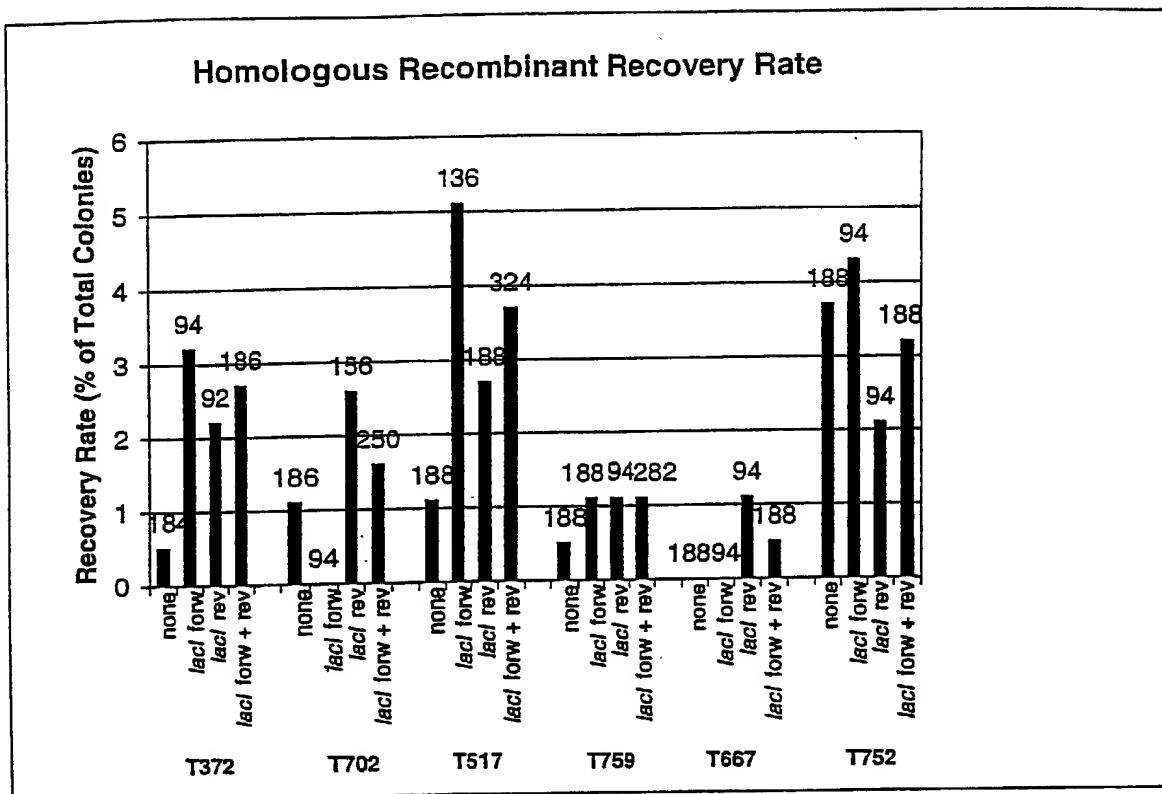


FIGURE 12

DOE E&P DEPT 2000 DEPT 2000
DOE E&P DEPT 2000 DEPT 2000

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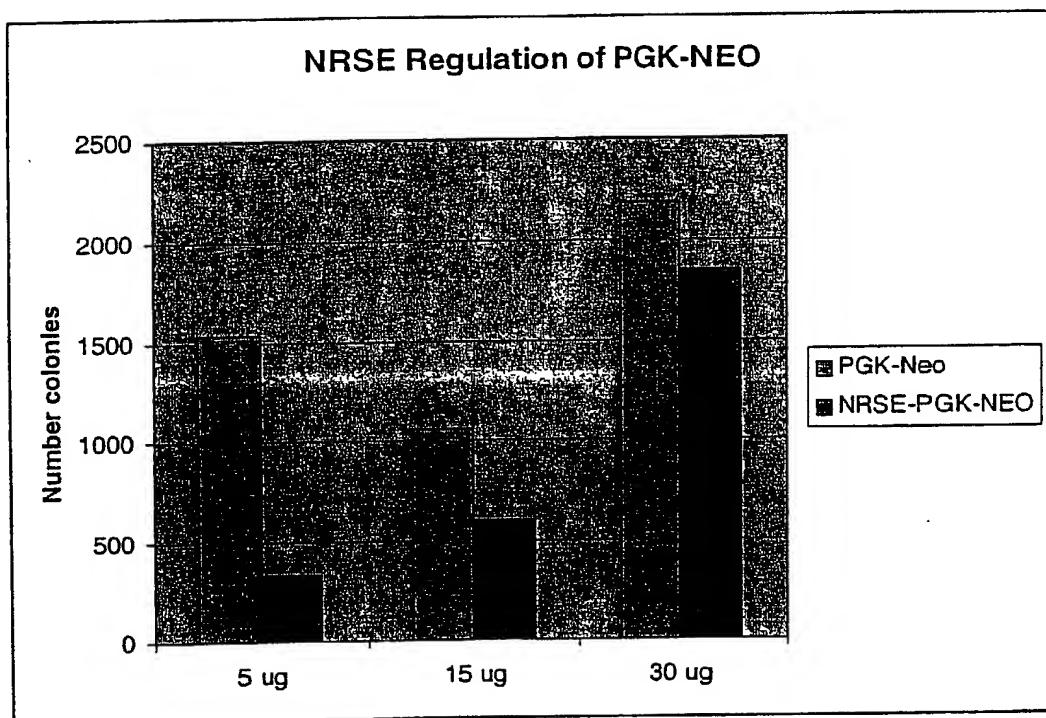


FIGURE 13



GCGGCCGCGAGTCGACGAGGCCGGCGATTAATTAAAGGCTCgacattgattattgactag
 ttattaatagaataatcaattacggggcattagttcatagccatatatggagttccgcgt
 tacataactacggtaaatggcccgctggctgaccgcccacagacccccccattgac
 gtcaataatgacgtATgtcccatagtaacgccaataggacttccattgacgtcaatg
 ggaggaggatttacggtaaaactgcccacttggcagtacatcaatgtatcatatgccaag
 tacgccccctattgacgtcaatgacggtaaatggcccgctggcattatgcccagtacAT
 GACCTTACGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCAT
 GGTTcggaggtgagccccacggttcactctcccatctccccccctccccaccccc
 caattttgtatt
 gggcgcgcgcaggcggggcggggcggggcggggcggggcggggcggggcggggcgg
 cggcggcggccataaaaAGCGAAGCGCGGGGGGGAGTCGCGTTGCCTTCG
 CCCCGTGCCCCCGCTCCGC CGC CCG CTCG CGC CCG CCCC CGC TCTG ACT GACC CG GT TA
 CTCCCCACAGGTGAGCGGGCGGGACGGCCCTCTCCTCCGGGCTGTAATTAGCGCTTGGTT
 TAATGACGGCTCGTTCTTCTGTGGCTGGCTGAAAGCCTAAAGGGCTCCGGGAGGGC
 CCTTTGTGCGGGGGGGAGCGGGCTCGGGGGGTGCGTGTGCGTGTGCGTGGGGAGCGC
 CGCGTGCGGCCCGCGCTGCCCGGGCTGTGAGCGCTGCGGGCGCGGGGGCTTGT
 GCGCTCCCGCGTGTGCGCGAGGGAGCGCGGGGGGGCGGGTGCCTCGGGGGGG
 CTGCGAGGGGACAACAAAGGCTCGTGCCTGGGGGTGTGCGTGGGGGGGTGAGCAAGGGGTGT
 GGGCGCGGGCGGTGCGGGCTGTAAACCCCCCTGCACCCCCCTCCCCGAGTTGCTGAGCACG
 GCCCGGCTTCGGGTGCGGGGCTCCGTGCGGGGGCTGCGCGGGGGCTCGCCGTGCCGGCG
 GGGGGTGGCGGCAGGTGGGGGTGCGCGGGGGGGGGCGCCCTCGGGCCGGGGGG
 CGGGGGAGGGGCGCGGGGGGGGGAGCGCGGGGGCTGTGAGGGCGCGGGAGCCCGAG
 CCATTGCTTTATGGTAATCGTGCAGAGAGGGCGCAGGGACTTCCTTTGTCCCCAAATCTG
 GCGGAGGCCAAATCTGGGAGGCAGCGCCGACCCCCCTCTAGCGGGCGGGCGAAGCGGT
 GCGGGCGCCGGCAGGAAGGAAATGGGCGGGGAGGGCCTCGTGCCTGCCTGCCGCGC
 CCCTTCTCCATCTCCAGGCTCGGGGCTGCCGAGGGGAGGGCTGCGCTTGGGGGGACG
 GGGCAGGGCGGGGTTCGGCTCTGGCTGTGACCGGGGcttaGAGCCTCTGCTAACCA
 TGTTCATGCCTCTTCTTCTACAGctcctggcaacgtgtggttgtgtgtc
 tcatatttggcaaaaatcGCCACCatggtagcaaggcgaggagctgttccacccgg
 ggtggtgccatctggtagctggacggcgacgtaaacggccacaaggtaatcagtg
 cggcgaggcgaggcgatggcacccatcgcaagctgaccctgtgaccacccctgac
 cggcaagctgcccgtgccctggccaccatcgacttcaagtccgcattgcgg
 cttagccgtaccccgaccacatgaaggcagcacttcaaggatccgcattgcgg
 aggctacgtccaggagcgcaccatcttcaaggacgacggcaactacaagacccgc
 cgaggtaagttcgagggcgacaccctggtaaccgcacatcgactgaaaggcat
 caaggaggacggcaacatctggggcacaagctggagatacaactacaacagcc
 acatcgatcgccatggccgacaacatcgacttcaaggatcgacttcaaggat
 catcgaggacggcagcgtcagctcgccgaccactaccccgacatcgccat
 cggccccgtgtgtccgcacaaccactacccatcgacccatcgccctgagca
 ccccaacgcgacatcgatcgatcgatcgatcgatcgatcgatcgatcgat
 tctcgatcgatcgatcgatcgatcgatcgatcgatcgatcgatcgatcgat
 GAAGGTGGTGGCTGGTGTGGCCAATGCCCTGGCTCACAAATACCACTGAGATCTTTCC
 CTCTGCCAAAATATGGGGACATCATGAAGCCCCTTGAGCATCTGACTTCTGGCTAATA
 AAGGAATTTATTTCTATTGCAATAGTGTGTTGAATTGGTGTCTCACTCGGAAG
 GACATATGGGAGGGCAAATCATTTAAACATCAGAATGAGTATTGGTTAGAGTTGGC
 AACATATGCCATATGCTGGCTGCCATGAACAAAGGTGGCTATAAAGAGGTGATCAGTATA
 TGAAACAGCCCCCTGCTGTCCATTCTTATTCCATAGAAAAGCCTTGACTTGAGGTAGA
 TTTTTTTATATTTGTTGTGTATTCTTAAACATCCCTAAATTTCTTAC
 ATGTTTACTAGCCAGATTTCTCCCTCTGACTACTCCAGTCATAGCTGCC
 TTCTCTTATGAAGATCccicgacctgcagccaaagctcgggggcaggtcggccgagcgat
 CGCGAGAATTGGCTTAAGTGAGTCGTATTACGGACTGGCCGTCGTTTACAACGTCGTG
 ACTGGGAAAACCCCTGGCGTTACCCAACCTTAATGCCCTTGAGCACATCCCCCTTCGCCA
 GCTGGCGTAATAGCGAAGAGGCCCGACCGATGCCCTTCCAAACAGTTGCGCAGCCTGA

FIGURE 14A

ATGGCGAATGGCGCTTCGCTTGGTAATAAGCCCGCTCGGCAGGGCTTTTTGGTTAA
CTACGTCAAGGTGGCACTTTGGGGAAATGTGCGCGGAACCCCTATTGTTTATTTCT
AAATACATTCAAATATGTATCCGCTCATGAGACAATAACCTGATAAAATGCTTCAATAAT
ATTGAAAAGGAAGAGTATGAGTATTCAACATTCCGTGTCGCCCTTATTCCCTTTTG
CGGCATTTGCCTTCCTGTTTGTCAACCCAGAAACGCTGGTAAAGTAAAAGATGCTG
AAGATCAGTTGGGTGCACCGAGTGGGTTACATGAACTGGATCTCAACAGCGGTAAGATCC
TTGAGAGTTTCGCCCCGAAGAACGTTCTCCAATGATGAGCACTTTAAAGTTCTGCTAT
GTGGCGCGGTATTATCCCGTGTGACGCCGGCAAGAGCAACTCGGTGCCGCATACACT
ATTCTCAGAATGACTGGGTGAGTACTCACAGTCACAGAAAAGCATCTTACGGATGGCA
TGACAGTAAGAGAATTATGCACTGCTGCCATAACCATGAGTGATAAACACTGCGGCCAACT
TACTCTGACAACGATGGAGGACCGAAGGAGCTAACCGCTTTTGCAACAACATGGGGG
ATCATGTAACTCGCTTGATCGTTGGAACCGGAGCTGAATGAAGCCATACCAAACGACG
AGCGTGACACCACGATGCTGTAGCAATGGCAACACGTTGCCAAACTATTAACTGGCG
AACTACTTACTCTAGCTCCCGGCAACAATTAAATAGACTGGATGGAGGCGGATAAAAGTTG
CAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTATTGCTGATAAAATCTGGAG
CCGGTGAGCGTGGTCTCGCGGTATCATTGCACTGGGCCAGATGGTAAGCCCTCCC
GTATCGTAGTTATCTACACGACGGGAGTCAGGCAACTATGGATGAAACGAAATAGACAGA
TCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTACTCAT
ATATACTTTAGATTGATTACCCGGTTGATAATCAGAAAAGCCCCAAAAACAGGAAGAT
TGTATAAGCAAATATTAAATTGTAACGTTAATATTGTTAAATTCGCTTAAATT
TTGTTAAATCAGCTCATTAAACCAATAGGCCAAATCGGAAAATCCCTATAAATC
AAAAGAAATAGCCGAGATAGGGTTGAGTGTGTTCCAGTTGGAAACAAGAGTCCACTATT
AAAGAACGTGGACTCCAACGTCAAAGGGCAGAACCGTCTATCAGGGCGATGGCCACT
ACGTGAACCATCACCCAAATCAAGTTTGGGTGAGGTGCCGTAAGCACTAAATCG
GAACCCCTAAAGGGAGCCCCCGATTAGAGCTTGACGGGAAAGCGAACGTGGCGAGAAAG
GAAGGGAAAGAAAGCGAAAGGAGCAGGGCGCTAGGGCGCTGGCAAGTGTAGCGGTACGCTG
CGCGTAACCACACACCCCGCGCTTAATGCGCCGTACAGGGCGCTAAAGGATCTA
GGTGAAGATCCTTTGATAATCTCATGACCAAAATCCCTAACGTGAGTTTCGTTCCA
CTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTCTTGAGATCCTTTCTGCG
CGTAATCTGCTGCTTGCAACAAAAAACACCGCTACAGCGGTGGTTGCGGGA
TCAAGAGCTACCAACTCTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATAACCAA
TACTGTTCTCTAGTGTAGCCGTAGTTAGGCCACCACTCAAGAACTCTGTAGCACGCC
TACATACCTCGCTCTGCTAACCTGTTACCGAGTGGCTGCTGCCAGTGGCGATAAGTCGTG
TCTTACCGGGGTGGAACAGACGATAGTTACCGGATAAGGCAGCGGTGGCTGAAC
GGGGGGTCTGACACAGCCAGCTGGAGCGAACGACCTACACCGAACTGAGATACCT
ACAGCGTGAGCTATGAGAAAGCGCACCGCTCCGAAGGGAGAAAGCGGACAGGTATCC
GGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTCCAGGGGAAACGCCCTG
GTATCTTATAGTCCTGTCGGGTTCGCCACCTCTGACTTGAGCGTCGATTTGTGATG
CTCGTCAGGGGGGGCGGAGCCTATGAAAAACGCCAGCAACCGGCCCTTTACGGTTCC
GGCCTTTGCTGGCCTTGCTCACATGTAATGTGAGTTAGCTCACTCATTAGGCACCCC
AGGCTTTACACTTATGCTTCCGGCTCGTATGTTGTGGAATTGTGAGCGGATAACAAAT
TTCACACAGGAAACAGCTATGACCATGATTACGCCAAGCTACGTAATACGACTCACTAG

FIGURE 14B